

FIG 1

Cross section of surface-micromachined high-pressure sensor

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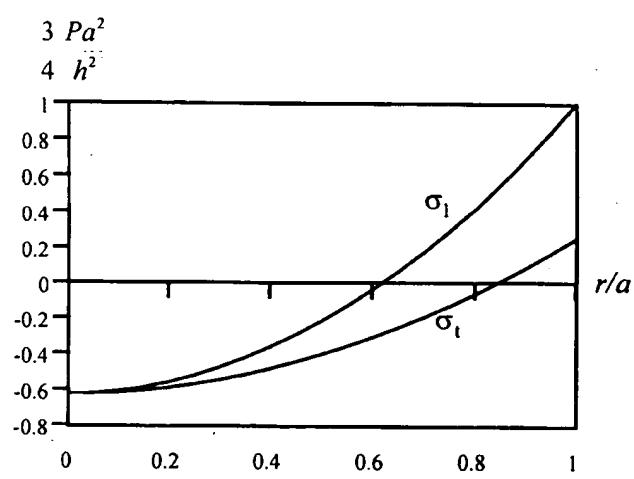
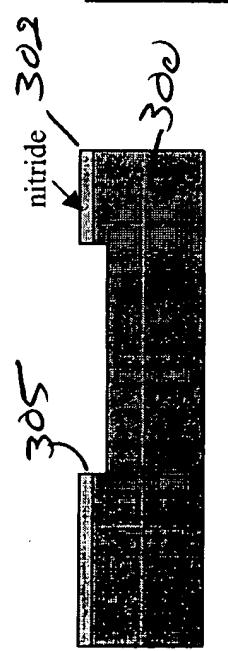
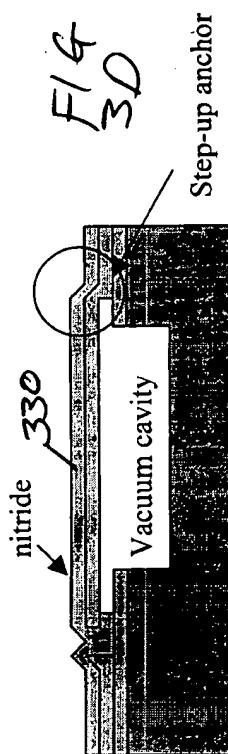


Figure 2 Longitudinal and transverse stress distribution along radius of a circular diaphragm.

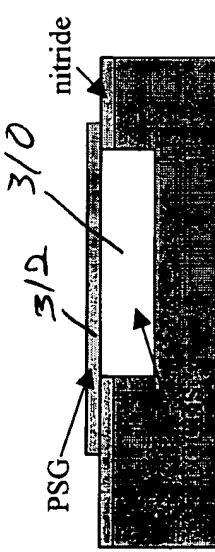


1. Deposit and pattern nitride.

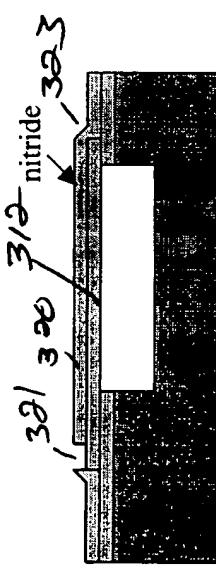


Step-up anchor

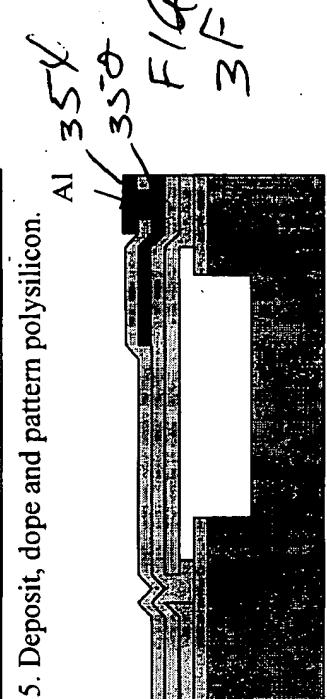
4. Remove oxide and PSG by 48%HF.
Deposit nitride



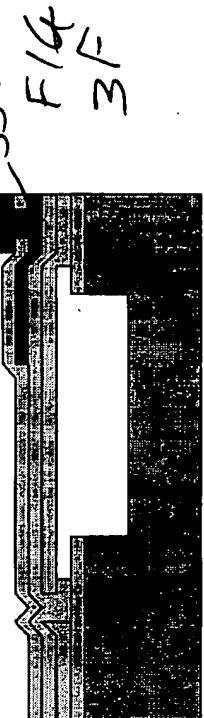
2. Local oxidation. Deposit and pattern phosphosilicate glass(PSG).



3. Deposit nitride and open etching holes.

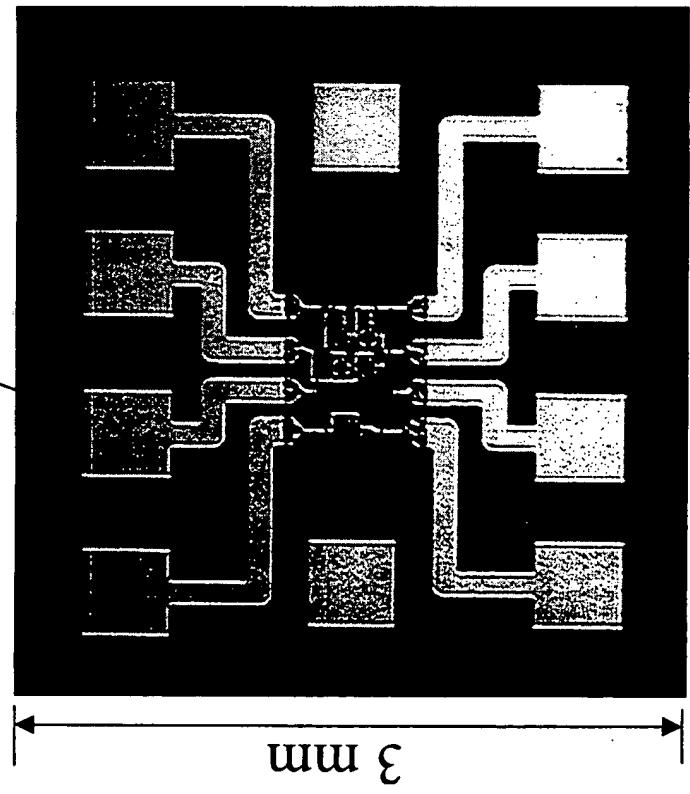


5. Deposit, dope and pattern polysilicon.

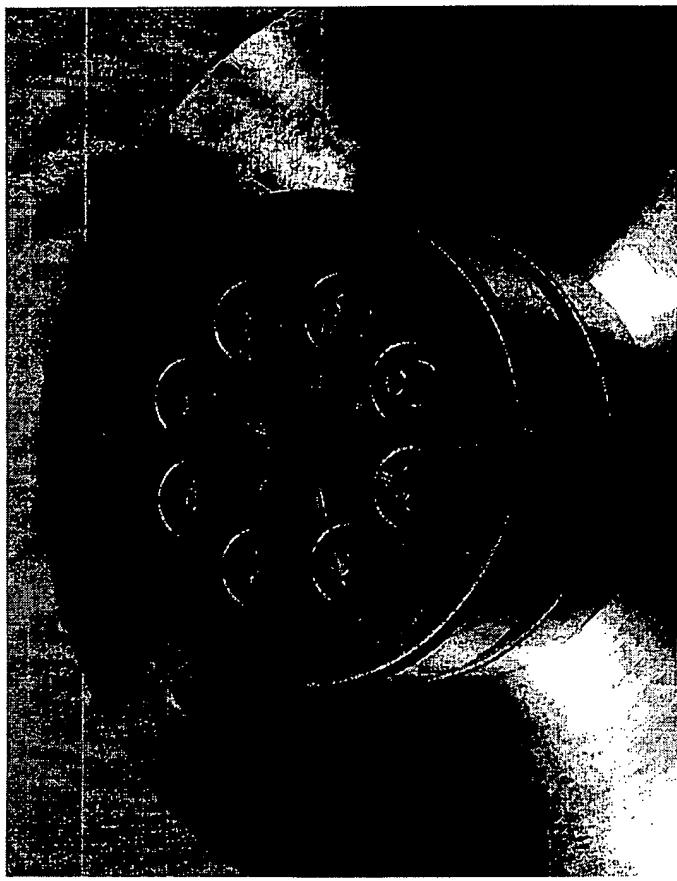


6. Deposit nitride as passivation layer and Al metallization.

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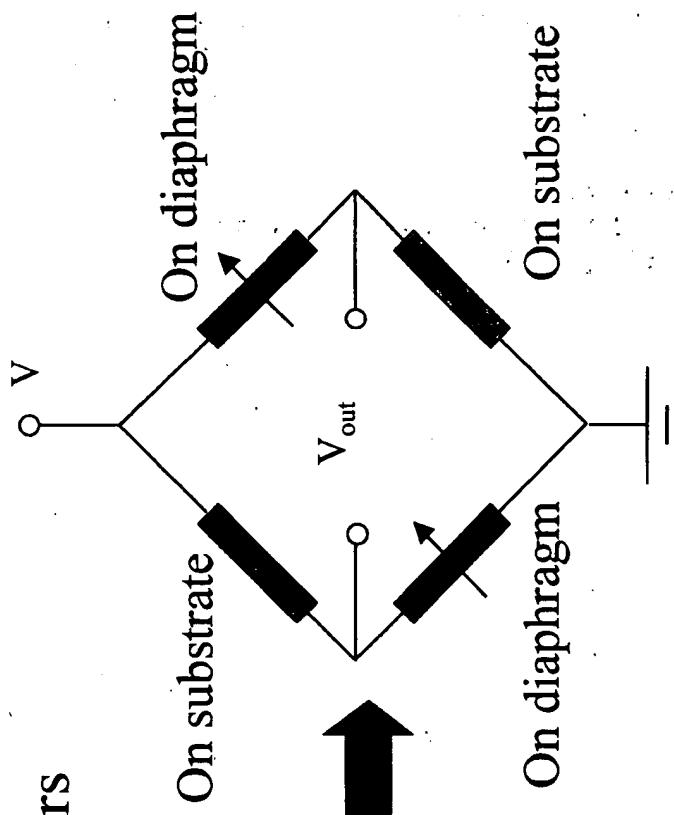
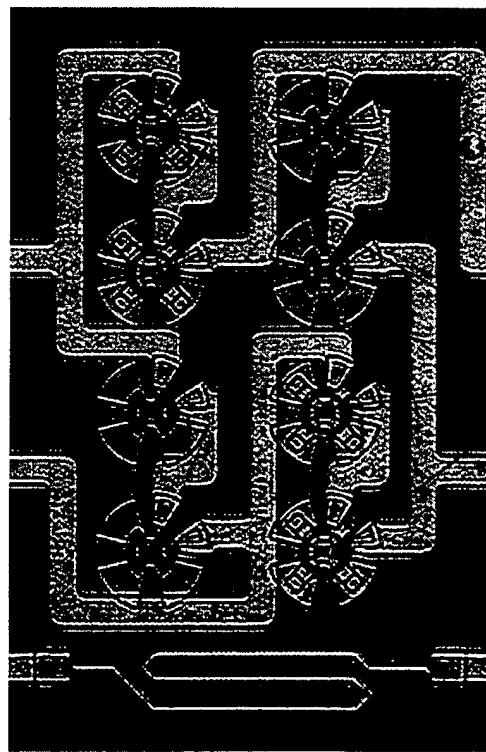
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Diced sensor chip

Chip wire-bonded to metal header

Polysilicon Pressure sensor:
thermistor 8 polysilicon resistors



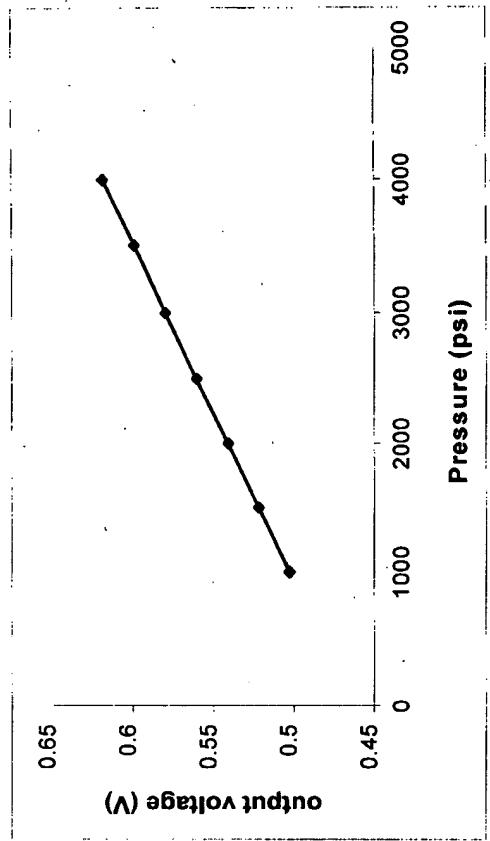
4 nitride Diaphragms

Multi-diaphragm configuration:

- minimize self-heating effect
 - make layout much easier

Wheatstone bridge

FIG 6



Calibration curve of the sensor ($T = 40^{\circ}\text{C}$)

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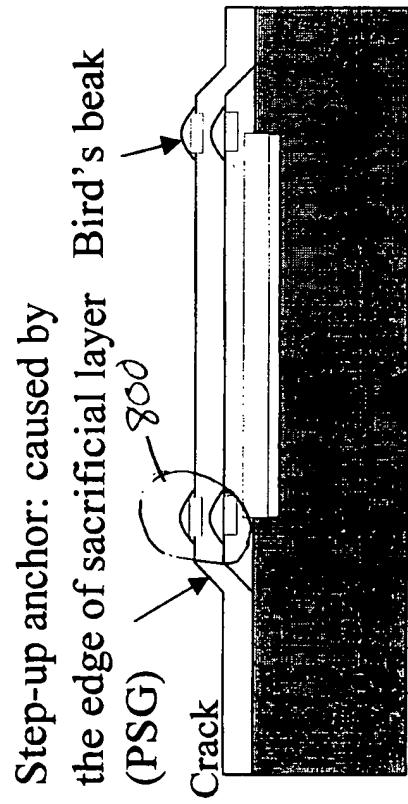


FIG 8

Cross section of sensor diaphragm

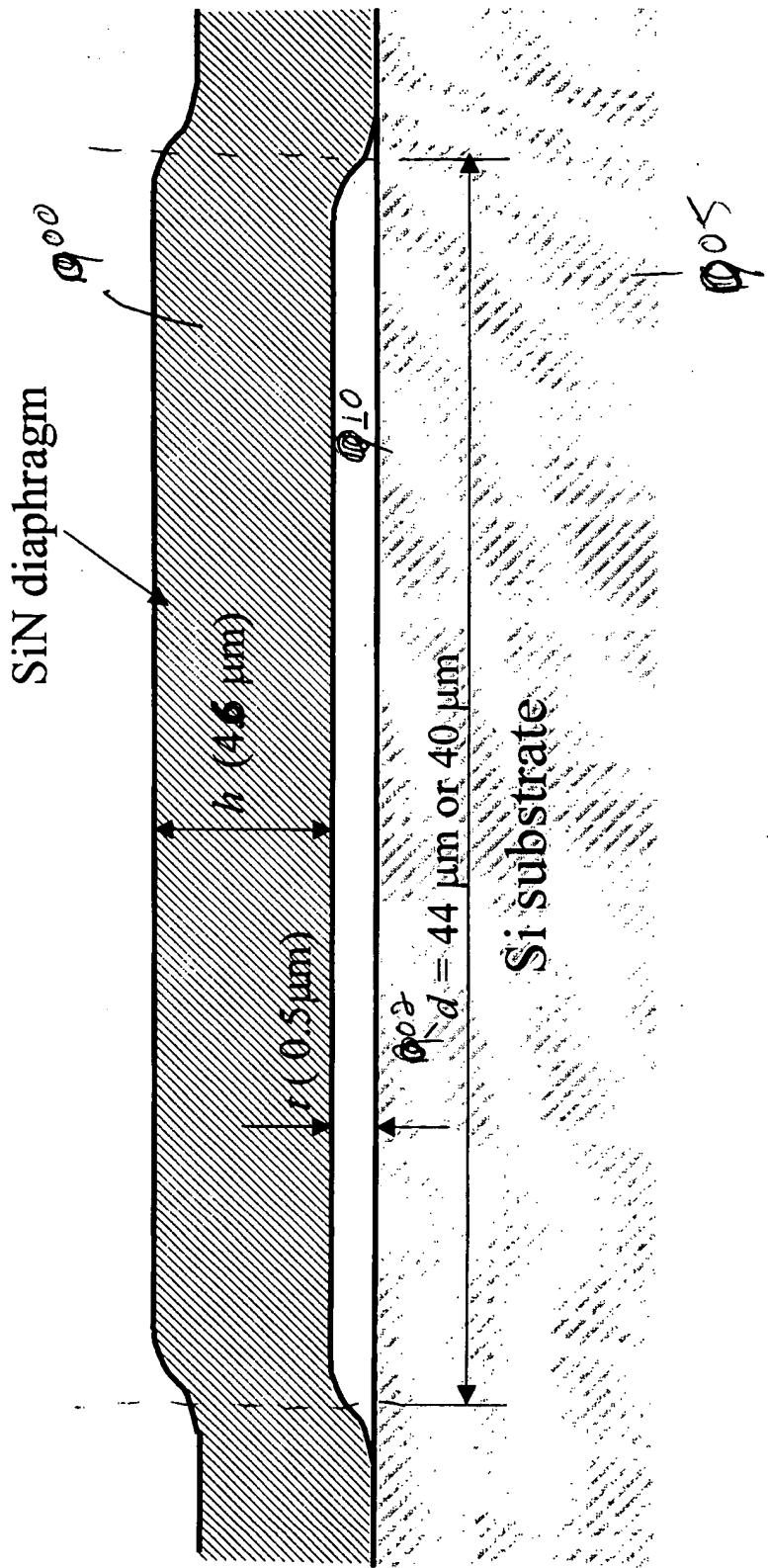
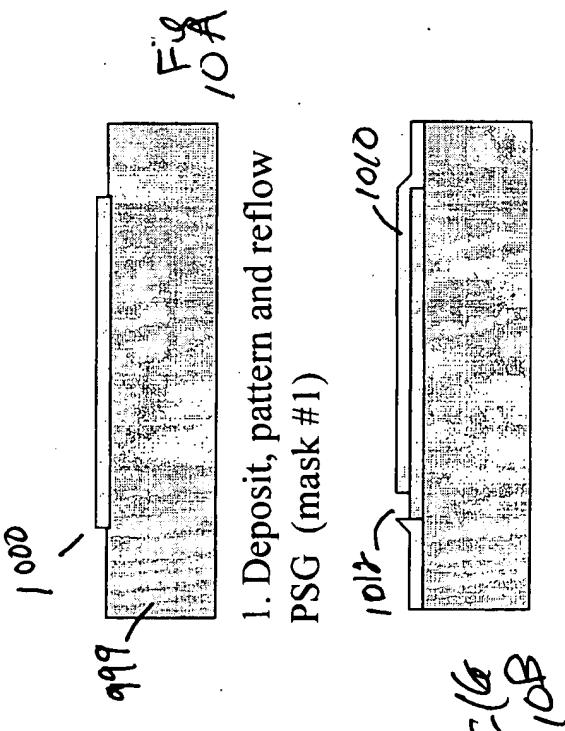
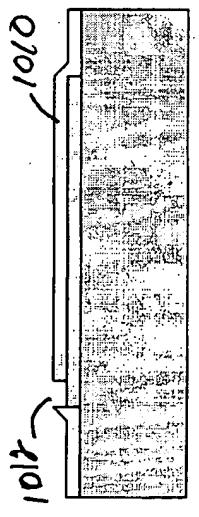


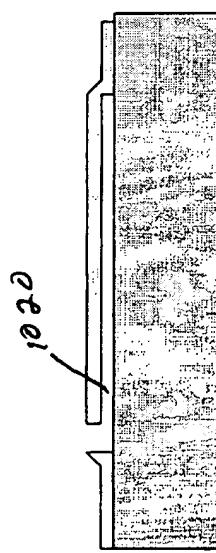
FIG 9



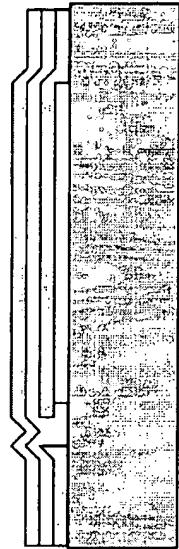
1. Deposit, pattern and reflow
PSG (mask #1)



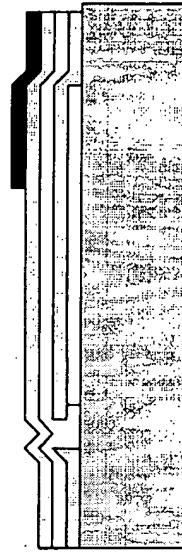
2. Deposit nitride and open etching holes
(mask #2)



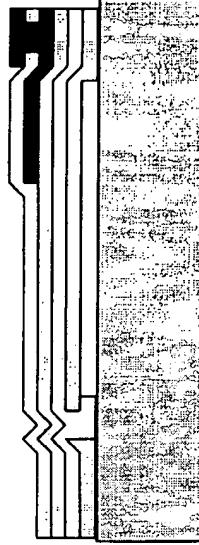
3. Removes PSG by concentrated HF



4. Deposit multi nitride layers

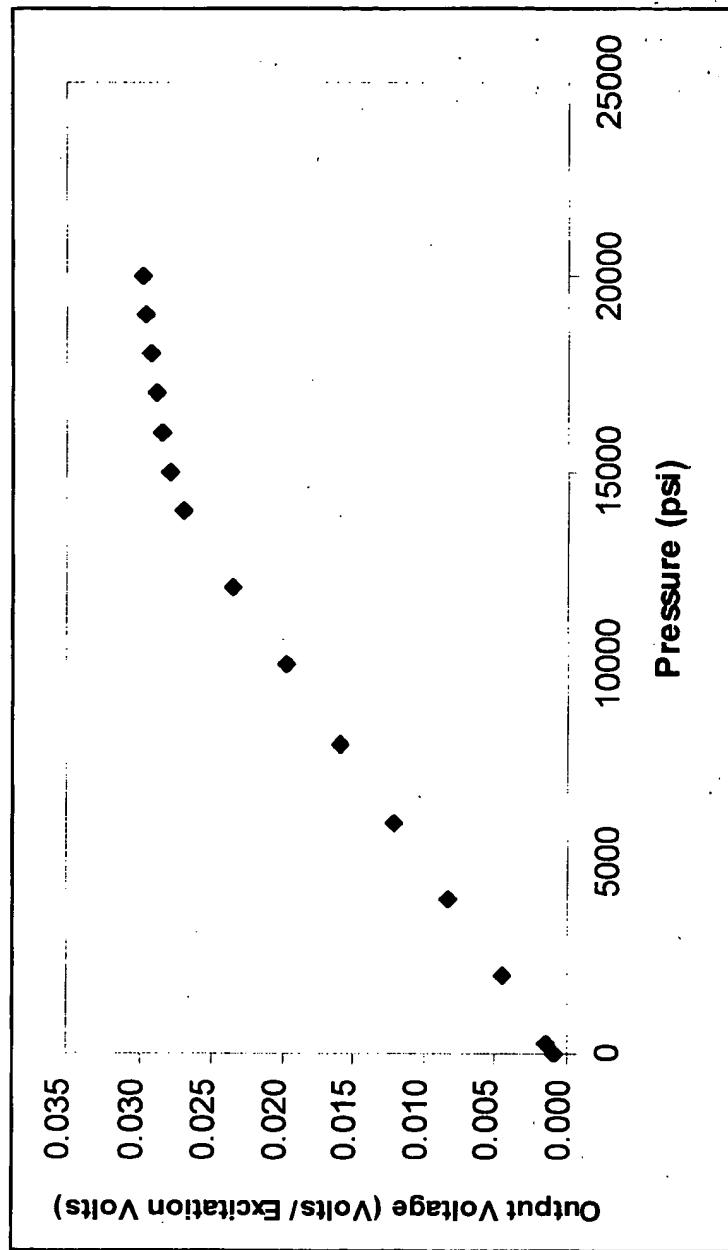


5. Deposit, dope and pattern poly
(mask #3 and #4)



6. Deposit thin nitride (0.2 Ω m), open
contact holes, and Al metalization
(mask #5 and #6)

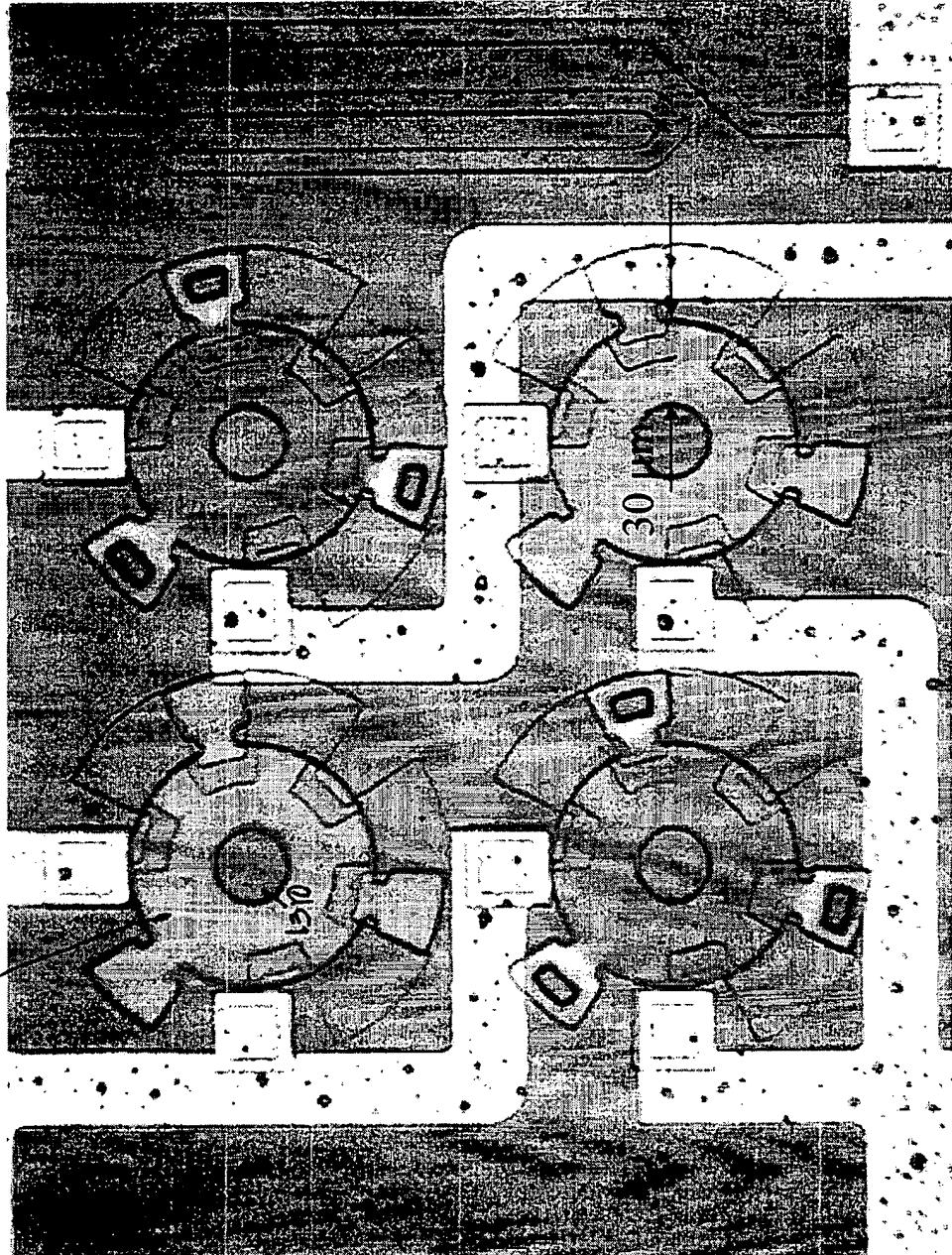
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1300 1305 1310 1308

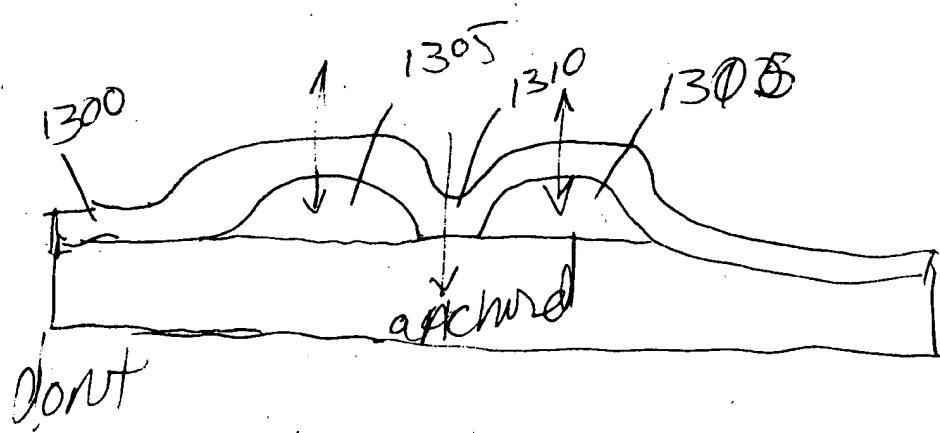


FIG 13